

ABSTRACT

A method for the manufacturing or repair of a superalloy gas turbine component including a liquid phase diffusion bonding process wherein the brazing heat treatment used for the diffusion bonding of a powder material to the component is accomplished by a heat cycle that is performed on the component for another purpose. A manufacturing solution heat treatment, a pre-weld heat treatment, a post-weld heat treatment, or a rejuvenating heat treatment may be used as the brazing heat treatment. The composition of the powder material is selected so that a desired set of material properties is achieved when the powder material is subjected to the dual-purpose heat cycle. In one embodiment, a 50/50 mixture of AM775 and IN939 powder is diffusion brazed to an IN939 superalloy component using a heat treatment which also functions as the post-casting solution heat treatment for the IN939 component.

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